SECTION 07 53 00

EPDM THERMOSET SINGLE-PLY ROOFING

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\*\* NOTE TO SPECIFIER \*\* Carlisle SynTec Systems; EPDM Thermoset Single-Ply Roofing.  
This section is based on the products of Carlisle SynTec Systems, which is located at:  
P. O. Box 7000  
Carlisle, PA 17013  
Toll Free Tel:   
800-4-SYNTEC  
Tel:   
717-245-7000  
Fax:   
717-245-7053  
Email: [info@carlislesyntec.com](mailto:info@carlislesyntec.com?subject=RE:ARCAT%20Spec%20Question%20(07530car):%20%20)  
Web: <https://www.carlislesyntec.com>   
  
 [ [Click Here](https://www.arcat.com/arcatcos/cos31/arc31255.html) ] for additional information.  
  
Carlisle's more than 40 years of manufacturing experience, over 10 billion square feet of membrane sold and nearly 250,000 warranted installations, positions the company as the single-ply roofing market leader. This role has been achieved through superior customer service and product innovation designed to enhance roof system performance and sustainability. When recently surveyed, architects and specifiers throughout the country, rated Carlisle superior to others for design and technical support and long-term warranties.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. EPDM thermoset single-ply roofing.
    2. Membrane flashings.
    3. Metal flashings.
    4. Roof insulation.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 03 30 00 - Cast-in-Place Concrete.
    2. Section 03 51 16 - Gypsum Concrete Roof Decks.
    3. Section 03 52 16 - Lightweight Cellular Insulating Concrete.
    4. Section 05 31 23 - Steel Roof Decking.
    5. Section 06 10 00 - Rough Carpentry.
    6. Section 07540 - PVC Thermoplastic Single-Ply Roofing.
    7. Section 07545 - TPO Thermoplastic Single-Ply Roofing.
    8. Section 07 62 00 - Sheet Metal Flashing and Trim.
    9. Section 07 70 00 - Roof and Wall Specialties and Accessories.
    10. Section 08 60 00 - Roof Windows and Skylights.
    11. Section 22 30 00 - Plumbing Equipment.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American Society of Civil Engineers (ASCE) - ASCE 7 - Minimum Design Loads for Buildings and Other Structures, Current Revision.
    2. ANSI/SPRI RP-4 "Wind Design Standard For Ballasted Single-ply Roofing Systems".
    3. ANSI/SPRI WD-1 "Wind Design Standard for Roofing Assemblies".
    4. ASTM International (ASTM):
       1. ASTM C 208 - Standard Specification for Cellulosic Fiber Insulating Board.
       2. ASTM C 578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
       3. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
       4. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
       5. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
       6. ASTM D 624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
       7. ASTM D 816 - Standard Test Methods for Rubber Cements.
       8. ASTM D 4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
       9. ASTM D 4637 - Standard Specification for EPDM Sheet Used In Single-Ply Roof Membrane.
       10. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.

\*\* NOTE TO SPECIFIER \*\* Retain the next paragraph only if building is FM insured. Delete if not required.

* + 1. Factory Mutual (FM Global):
       1. Approval Guide.
          1. Factory Mutual Standard 4470 - Approval Standard for Class 1 Roof Covers.
          2. Loss Prevention Data Sheets 1-28, 1-29.
    2. International Code Council (ICC):
       1. International Building Code (IBC).
    3. National Roofing Contractors Association (NRCA) - Low Slope Roofing and Waterproofing Manual, Current Edition.
    4. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.
    5. Underwriters Laboratories (UL):
       1. TGFU R1306 - "Roofing Systems and Materials Guide".
       2. UL-790 - Standard Test Method for Fire Tests of Roof Coverings.
    6. ANSI/ASHRAE/IESNA Standard 90.1 (2007): Energy Standard for Buildings Except Low-Rise Residential Buildings

\*\* NOTE TO SPECIFIER \*\* Retain only design criteria required for the project and delete those not required or not applicable.

* 1. DESIGN CRITERIA
     1. Wind Uplift Performance:

\*\* NOTE TO SPECIFIER \*\* Select required wind uplift performance criteria. Performance may be specified by referencing ASCE-7, by reference of an FM tested assembly, or by utilizing a DORA Assembly number.

* + - 1. Roof system is designed to withstand wind uplift forces as calculated using the current revision of ASCE-7.

\*\* NOTE TO SPECIFIER \*\* Insert the appropriate FM rating as found in the current FM Guide.

* + - 1. Roof system is designed to achieve a FM 1-\_\_\_ wind uplift rating. (if building is insured by FM otherwise delete this link.)
      2. Roof System is designed to achieve \_\_\_-psf of uplift testing.

\*\* NOTE TO SPECIFIER \*\* Insert the appropriate DORA Assembly number as found in the current Directory of Roof Assemblies (DORA) by SPRI.

* + - 1. Roof system is designed to achieve a DORA Assembly number \_\_\_ .

\*\* NOTE TO SPECIFIER \*\* Contact Carlisle if a higher wind speed warranty is desired.

* + - 1. Carlisle offers a standard 55 MPH wind speed warranty. Please contact Carlisle if a higher wind speed warranty is desired.
    1. Fire Resistance Performance:

\*\* NOTE TO SPECIFIER \*\* Select fire rating. Delete two of the next three paragraphs.

* + - 1. Roof system will achieve a UL Class A rating when tested in accordance with UL-790.
      2. Roof system will achieve a UL Class B rating when tested in accordance with UL-790.
      3. Roof system will achieve a UL Class C rating when tested in accordance with UL-790.

\*\* NOTE TO SPECIFIER \*\* Insert LTTR Value. Modify R value' to LTTR value' where Polyisocyanurate insulation is not used in the system.

* + 1. Thermal Performance: Roof system will achieve a minimum R value not less than \_\_\_\_.
    2. Drainage: Provide a roof system with positive drainage where all standing water dissipates within 48 hours after precipitation ends.
    3. Building Codes:
       1. Roof system will meet the requirements of all federal, state and local code bodies having jurisdiction.
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00.
     2. Product Data: Manufacturer's data sheets on each product to be used, including:
        1. Preparation instructions and recommendations.
        2. Storage and handling requirements and recommendations.
        3. Installation methods.
     3. Detail Drawings:
        1. Submit approved plan, section, elevation or isometric drawings which detail the appropriate methods for all flashing conditions found on the project.
        2. Coordinate approved drawings with locations found on the Contract Drawings.

\*\* NOTE TO SPECIFIER \*\* Delete selection samples if colors have already been selected.

* + 1. Selection Samples: For each finish product specified, two complete sets of chips representing manufacturer's full range of available colors, membranes, and thicknesses.
    2. Verification Samples: For each finish product specified, two samples, minimum size 4 inches (100 mm) square representing actual product, color, and patterns.
  1. QUALITY ASSURANCE
     1. Manufacturer Qualifications: All products specified in this section will be supplied by a single manufacturer with a minimum of twenty (20) years experience.
     2. Installer Qualifications:
        1. All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.

\*\* NOTE TO SPECIFIER \*\* retain one of the next two paragraphs only if manufacturer supplied guaranties are specified. Delete if not required.

* + - 1. Installer must be capable of extending the Manufacturer's Labor and Materials guarantee.
      2. Installer must be capable of extending the Manufacturer's No Dollar Limit guarantee.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Provide a mock-up for evaluation of surface preparation, installation techniques and workmanship.
       1. Finish areas designated by Architect.
       2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
       3. Refinish mock-up area as required to produce acceptable work.
  1. DELIVERY, STORAGE, AND HANDLING
     1. Store products in manufacturer's unopened packaging until ready for installation.
     2. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.
  2. PROJECT CONDITIONS
     1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
     2. Refer to Carlisle's Roofing System specification, Part II - Application, for General Job Site Considerations.
     3. Safety Data Sheets (SDS) must be on location at all times during the transportation, storage and application of materials.
     4. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.
     5. When loading materials onto the roof, the Carlisle Authorized Roofing Applicator must comply with the requirements of the building owner to prevent overloading and possible disturbance to the building structure.
     6. Proceed with roofing work only when weather conditions are in compliance with the manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirements and recommendations.
     7. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage.
     8. Provide protection, such as 3/4 inch thick plywood, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.
     9. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.
     10. New roofing shall be complete and weathertight at the end of the work day.
     11. Contaminants such as grease, fats and oils shall not be allowed to come in direct contact with the roofing membrane.
  3. WARRANTY
     1. At project closeout, provide to Owner or Owners Representative an executed copy of the manufacturer's Total-System warranty, outlining its terms, conditions, and exclusions from coverage.

\*\* NOTE TO SPECIFIER \*\* Select warranty duration. 5-year warranty is available for all roof systems listed in this section.

* + - 1. 5 years.

\*\* NOTE TO SPECIFIER \*\* Select warranty duration. 10-year warranty is available for all roof systems listed in this section.

* + - 1. 10 years.

\*\* NOTE TO SPECIFIER \*\* Select warranty duration. 15-year warranty is only available for:  
- Adhered 45-, 60- and 90-mil non-reinforced black EPDM  
- Ballasted 45-, 60- and 90-mil non-reinforced black EPDM  
- Adhered 45-, 60- and 75-mil reinforced black EPDM  
- Mechanically Fastened 60- and 75-mil reinforced black EPDM  
- Adhered 60- and 90-mil non-reinforced white EPDM  
- Adhered 100-, 115- and 145-mil black EPDM FleeceBACK  
- Adhered 100-, 115- and 145-mil white EPDM FleeceBACK  
- Hot Mopped 90- and 105-mil AFX EPDM FleeceBACK  
- Roof Garden

* + - 1. 15 years.

\*\* NOTE TO SPECIFIER \*\* Select warranty duration. 20-year warranty is only available for:  
- Adhered 60- and 90-mil non-reinforced black EPDM  
- Ballasted 45-, 60- and 90-mil non-reinforced black EPDM  
- Adhered 60- and 75-mil reinforced black EPDM  
- Mechanically Fastened 60- and 75-mil reinforced black EPDM  
- Adhered 60- and 90-mil non-reinforced white EPDM  
- Adhered 115- and 145-mil black EPDM FleeceBACK  
- Adhered 115- and 145-mil white EPDM FleeceBACK  
- Hot Mopped 90- and 105-mil AFX EPDM FleeceBACK  
- Roof Garden

* + - 1. 20 years.

\*\* NOTE TO SPECIFIER \*\* Select warranty duration. 25-year warranty is only available for:  
- Adhered 60- and 90-mil non-reinforced black EPDM  
- Ballasted 60- and 90-mil non-reinforced black EPDM  
- Adhered 75-mil reinforced black EPDM  
- Mechanically Fastened 75-mil reinforced black EPDM  
- Adhered 60- and 90-mil non-reinforced white EPDM  
- Adhered 145-mil black EPDM FleeceBACK  
- Adhered 145-mil white EPDM FleeceBACK  
- Hot Mopped 105-mil AFX EPDM FleeceBACK

* + - 1. 25 years.

\*\* NOTE TO SPECIFIER \*\* Select warranty duration. 30-year warranty is only available for:  
- Adhered 90-mil non-reinforced black EPDM  
- Ballasted 90-mil non-reinforced black EPDM  
- Adhered 75-mil reinforced black EPDM  
- Mechanically Fastened 75-mil reinforced black EPDM  
- Adhered 90-mil non-reinforced white EPDM  
- Adhered 145-mil black EPDM FleeceBACK  
- Adhered 145-mil white EPDM FleeceBACK

* + - 1. 30 years.

\*\* NOTE TO SPECIFIER \*\* Delete if not required. Puncture coverage is only available for:  
- Adhered 90-mil non-reinforced black EPDM  
- Adhered 45-, 60- and 75-mil reinforced black EPDM  
- Mechanically Fastened 45-, 60- and 75-mil reinforced black EPDM  
- Adhered 90-mil non-reinforced black EPDM  
- Adhered 100-, 115- and 145-mil black EPDM FleeceBACK  
- Adhered 100-, 115- and 145-mil white EPDM FleeceBACK  
- Hot Mopped 90- and 105-mil AFX EPDM

* + - 1. Coverage to be extended to include accidental punctures in accordance with terms stated in the Warranty document.

\*\* NOTE TO SPECIFIER \*\* Select hail coverage where specified. Delete two of the next three paragraphs or all three if Hail coverage is not required.  
\*\* NOTE TO SPECIFIER \*\* 1" Hail coverage is only available for:  
- Adhered 60- and 90-mil non-reinforced black EPDM (Requires Dens-Deck, Securock, SecurShield HD, SecurShield HD Plus, Securshield HD Composite orStormbase Composite)  
 - Ballasted 45-, 60-mil and 90-mil non-reinforced black EPDM  
- Adhered 60- and 75-mil reinforced black EPDM  
- Adhered 60- and 75-mil non-reinforced white EPDM  
- Adhered 100-, 115- and 145-mil black EPDM FleeceBACK  
- Adhered 100-,115-mil and 145-mil white EPDM FleeceBACK  
- Hot Mopped 90- and 105-mil AFX EPDM FleeceBACK

* + - 1. Coverage to be extended to include damage caused by a maximum 1 inch (25 mm) diameter hail in accordance with terms stated in the Warranty document.

\*\* NOTE TO SPECIFIER \*\* 2" Hail coverage is only available for:  
- Adhered 90-mil non-reinforced black EPDM (Requires Dens-Deck, Securock, SecurShield HD, SecurShield HD Plus, SecurShield HD Composite or Stormbase Composite)  
- Ballasted 60- or 90-mil non-reinforced black EPDM  
- Adhered 75-mil reinforced black EPDM  
- Adhered 60- or 90-mil non-reinforced white EPDM  
- Adhered 115- and 145-mil black EPDM FleeceBACK  
- Adhered 115-mil white EPDM FleeceBACK  
- Hot Mopped 105-mil AFX EPDM FleeceBACK

* + - 1. Coverage to be extended to include damage caused by a maximum 2 inch (51 mm) diameter hail in accordance with terms stated in the Warranty document.
      2. Coverage to be extended to include roof edge metal water tightness in accordance with terms stated in the Warranty document.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Carlisle SynTec Systems, which is located at: P. O. Box 7000; Carlisle, PA 17013; ASD Toll Free Tel: ; 800-4-SYNTEC; Tel: ; 717-245-7000; Fax: ; 717-245-7053; Email: <info@carlislesyntec.com>; Web: <https://www.carlislesyntec.com> .

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.
  1. SCOPE / APPLICATION
     1. Roof System: Provide a waterproof roof system, capable of withstanding uplift forces as specified in Design Criteria.
     2. Base Flashing: Provide a waterproof, fully adhered base flashing system at all penetrations, plane transitions and terminations.

\*\* NOTE TO SPECIFIER \*\* Delete the next paragraph if roof insulation is not specified.

* + 1. Insulation: Provide a roof insulation system beneath the finish membrane.

\*\* NOTE TO SPECIFIER \*\* Delete the next paragraph if a roof garden assembly is not specified.

* + 1. Roof Garden Assembly:
       1. Provide an Intensive planting system with a soil depth greater than 8 inches (204 mm) with a variety of plants such as sod grass, annual or perennial flowers, shrubs and small trees. Structure must be capable of withstanding the additional dead loads as calculated by the Project Engineer which typically exceed 48 lbs per square foot.
       2. Provide an Extensive planting system with a soil depth of 4 inches to 8 inches (102 to 204 mm) where recommended plants include sedums, herbs, grasses and other vegetation which can grow in this depth of media. Structure must be capable of withstanding the additional dead loads as calculated by the Project Engineer which are typically between 24 to 48 lbs per square foot.
          1. As an alternate to Ultra-Extensive or Extensive traditional, Carlisle Green Grid System may be used.
       3. Provide an Ultra-Extensive planting system with a soil depth less than 4 inches (102 mm) ideally suited for areas that will receive little maintenance. Recommended plants include sedums, herbs and grasses. Structure must be capable of withstanding the additional dead loads as calculated by the Project Engineer which are typically less than 24 lbs per square foot.

\*\* NOTE TO SPECIFIER \*\* Delete the next article if a base sheet is not required. Retain only base sheet type required and delete all others.

* 1. MEMBRANE BASE SHEET
     1. Carlisle FR Base Sheet 1S: A non-asphaltic, resin-bound, fiberglass-reinforced mat, coated on one side with a mineral-filled fire-resistant coating (42 inch wide and 200' long). Designed for use as a suitable substrate for direct application of Mechanically Fastened Roofing Systems over decks requiring a fastened base sheet.

\*\* NOTE TO SPECIFIER \*\* Delete the next paragraph if a Hot Mopped FleeceBACK Roofing System is not specified.

* + 1. Carlisle SureMB 70 SA Modified Base Sheet: 70-mil smooth surface, self-adhered base ply. Reinforced with a fiberglass mat that is saturated and coated with asphaltic bitumen and SBS elastomer and meets ASTM D6163 Type 1, Grade S. 70 SA is designed to be used as a base ply or interplay in Carlisle's multiple-ply system and can be used as an air and vapor barrier or temporary (up to 60 days) roof. Available in 39-3/8" wide and 61' long (200 square feet) weighing 0.39 lbs per square foot.
    2. Carlisle SureMB 90 Modified Base Sheet: 90-mil Glass fiber, reinforced, SBS-modified asphalt, base sheet that meets ASTM D 6163 Type I, Grade S for SBS-modified bituminous sheet materials. May be used as an air barrier, vapor barrier and temporary (Up to 60 days) roof. Available in 39-3/8" wide and 49'-1" long (161 square feet) weighing 0.58 lbs per square foot.
    3. Carlisle SureMB 90TG Base - 94-mil smooth-surfaced, SBS, torch-applied membrane. Reinforced with a fiberglass mat that is saturated and coated with asphaltic bitumen and SBS elastomers which meets ASTM D6163 Type I, Grade S. SureMB 90TG is designed for use as a base-ply or inter-ply in Carlisle's multiple-ply system and can be used as an air barrier, vapor barrier or temporary (Up to 60 days) roof. Available in rolls 39-3/8" wide and 49'-1" long (164 square feet) and weighing 0.57 lbs per square foot.
    4. Carlisle SureMB 120TG Base Sheet: A smooth-surfaced, torch-grade SBS base ply, reinforced with a non-woven polyester mat that is saturated and coated with asphaltic bitumen and SBS elastomers.
    5. VapAir Seal 725TR Air/Vapor Barrier: A 40-mil composite consisting of 35-mils of self-adhering rubberized asphalt laminated to a 5-mil woven polypropylene film.
    6. VapAir Seal MD Air/Vapor Barrier: reinforced composite aluminum foil with self-adhesive SBS backing and removable poly release film. Used for direct application over metal decks.
  1. INSULATION
     1. Polyisocyanurate InsulBase: Carlisle InsulBase. Rigid board with glass fiber reinforced facers (GRF) on both sides, meeting or exceeding the requirements of ASTM C 1289, Type II, Class 1.

\*\* NOTE TO SPECIFIER \*\* Delete grade not required.

* + - 1. Compressive Strength: Grade 2 (20 psi) (138 kPa).
      2. Compressive Strength: Grade 3 (25 psi) (173 kPa).
      3. Density: 2 lb per cubic foot (24 kg/cu m) minimum.
    1. SecurShield Polyiso: Rigid board with coated glass fiber mat facers (CGF) on both sides, meeting or exceeding the requirements of ASTM C 1289, Type II, Class 2.

\*\* NOTE TO SPECIFIER \*\* Delete grade not required.

* + - 1. Compressive Strength: Grade 2 (20 psi) (138 kPa).
      2. Compressive Strength: Grade 3 (25 psi) (173 kPa).
      3. Density: 2 lb per cubic foot (24 kg/cu m) minimum.
    1. Composite Board: Composite insulation panel comprised of 1/2 inch (13 mm) high-density Polyiso cover board laminated during the manufacturing process to SecurShield rigid Polyiso roof insulation meeting ASTM C1289. Carlisle SecurShield HD Composite.
       1. Top Layer: ASTM C1289 Type II, Class 4, Grade 1.
       2. Compressive Strength: 80 psi min. (751 kPa)
       3. Board Thickness: 1/2 inch (13 mm)
       4. Bottom Layer: ASTM C1289 Type II, Class 2
       5. Compressive Strength: Grade 2 (20 psi) (138 kPa).
    2. Composite Board: Polyisocyanurate foam insulation with GP Dens-Deck gypsum board laminated to one side and glass fiber reinforced facers (GRF) laminated to one side, meeting or exceeding the requirements of ASTM C 1289. Carlisle HP-DD.
       1. Compressive Strength (Polyiso): 20 psi (138 kPa).
       2. Density (Polyiso): 2 lb per cubic foot (24 kg/cu m) minimum.

\*\* NOTE TO SPECIFIER \*\* Select Gypsum Board Type. Delete one of the next two paragraphs.

* + - 1. Gypsum Board: Dens-Deck.
      2. Gypsum Board: Dens-Deck Prime.

\*\* NOTE TO SPECIFIER \*\* Select Gypsum thickness. Delete two of the next three paragraphs.

* + - 1. Gypsum Board Thickness: 1/4 inch (6 mm).
      2. Gypsum Board Thickness: 1/2 inch (13 mm).
      3. Gypsum Board Thickness: 5/8 inch (16 mm).
    1. Composite Board: Polyisocyanurate foam insulation with 1/2 inch (13 mm) wood fiber roof insulation laminated to one side and glass fiber reinforced facers (GRF) laminated to one side, meeting or exceeding the requirements of ASTM C 1289. Carlisle HP-WF.
       1. Compressive Strength (Polyiso): 20 psi (138 kPa).
       2. Compressive Strength (Wood Fiber): 35 psi (241.5 kPa).
       3. Density (Polyiso): 2 lb per cubic foot (24 kg/cu m) minimum.
    2. Composite Board: Polyisocyanurate foam insulation with 7/16 inch (11 mm) Oriented Strand Board (OSB) laminated to one side and glass fiber reinforced facers (GRF) laminated to one side, meeting or exceeding the requirements of ASTM C 1289. Carlisle StormBase Composite.
       1. Oriented Strand Board: 7/16 inch (11 mm) thick.
       2. Compressive Strength (Polyiso): 20 psi (138 kPa).
       3. Density (Polyiso): 2 lb per cubic foot (24 kg/cu m) minimum.
    3. Expanded Polystyrene (EPS): Rigid, closed cell foam insulation meeting ASTM C 578. Carlisle Sure-Seal.

\*\* NOTE TO SPECIFIER \*\* Select Compressive strength based on insulation type. Delete two of the next three paragraphs.

* + - 1. Density: 1 Lb min.
      2. Density: 1.25 Lb min.
      3. Density: 1.5 Lb min.
    1. Extruded Polystyrene (XPS): Rigid, closed-cell structured thermal barrier meeting ASTM C 578. Foamular, distributed by Carlisle.

\*\* NOTE TO SPECIFIER \*\* Select insulation type. Delete three of the next four paragraphs.

* + - 1. Foamular 250 Compressive Strength - 25 psi (1.75 kg/sq.cm.) minimum.
      2. Foamular 400: Compressive Strength - 40 psi (2.8 kg/sq.cm.) minimum.
      3. Foamular 600: Compressive Strength - 60 psi (4.2 kg/sq.cm.) minimum.
      4. Foamular1000: Compressive Strength - 100 psi (7.03kg/sq.cm.) minimum.
    1. Extruded Polystyrene (XPS): Rigid, closed-cell recovery board meeting ASTM C 578. Foamular Durapink, distributed by Carlisle.

\*\* NOTE TO SPECIFIER \*\* Select insulation type. Delete two of the next three paragraphs.

* + - 1. 1 inch (25 mm): Compressive Strength - 25 psi (1.75 kg/sq.cm.) minimum.
      2. 3/4 inch (19 mm): Compressive Strength - 25 psi (1.75 kg/sq.cm.) minimum.
      3. 1/2 inch (13 mm): Compressive Strength - 25 psi (1.75 kg/sq.cm.) minimum.
    1. Extruded Polystyrene (XPS): Rigid, closed-cell structured thermal barrier meeting ASTM C 578. Dow Styrofoam, distributed by Carlisle.

\*\* NOTE TO SPECIFIER \*\* Select insulation type based on project requirements. Delete three of the next four paragraphs.

* + - 1. Deckmate: Compressive Strength - 18 psi (1.27 kg/sq.cm.) minimum.
      2. Deckmate Plus: Compressive Strength - 25 psi (1.75 kg/sq.cm.) minimum.
      3. Roofmate: Compressive Strength - 40 psi (2.8 kg/sq.cm.) minimum.
      4. Plazamate: Compressive Strength - 60 psi (4.2 kg/sq.cm.) minimum.
    1. Water-resistant and silicone treated gypsum panel with embedded fiberglass facer on both sides, and pre-primed on one side. GP Gypsum Dens-Deck Prime, distributed by Carlisle.

\*\* NOTE TO SPECIFIER \*\* Select thickness. Delete three of the next four paragraphs.

* + - 1. Board Thickness: 1/4 inch (6 mm).
      2. Board Thickness: 3/8 inch (10 mm).
      3. Board Thickness: 1/2 inch (13 mm).
      4. Board Thickness: 5/8 inch (15 mm).
    1. Moisture-, mold- and impact-resistant, nonstructural fiber-reinforced gypsum panel made from 95 percent recycled materials. Securock, distributed by Carlisle.

\*\* NOTE TO SPECIFIER \*\* Select thickness. Delete three of the next four paragraphs.

* + - 1. Board Thickness: 1/4 inch (6 mm).
      2. Board Thickness: 3/8 inch (10 mm).
      3. Board Thickness: 1/2 inch (13 mm).
      4. Board Thickness: 5/8 inch (15 mm).
    1. SecurShield HD Polyiso Cover board: Rigid board with coated glass fiber mat facers (CGF) on both sides, meeting or exceeding the requirements of ASTM C 1289, Type II, Class 4, Grade 1.
       1. Compressive Strength: 80 psi min. (751 kPa).
       2. Board Thickness: 1/2 inch (13 mm).
    2. SecurShield HD Plus Polyiso Cover board: Rigid board with coated glass fiber mat facers (CGF) on both sides, meeting or exceeding the requirements of ASTM C 1289, Type II, Class 4, Grade 1. Designed for higher uplift with fewer fasteners per board.
       1. Compressive Strength: 80 psi min. (751 kPa).
       2. Board Thickness: 1/2 inch (13 mm).

\*\* NOTE TO SPECIFIER \*\* Delete the entire next article if insulation adhesive is not required.

* 1. INSULATION ADHESIVE
     1. Flexible FAST Adhesive: A spray or extruded applied, two-component polyurethane, low-rise expanding foam adhesive used for attaching approved insulations to compatible substrates (concrete, cellular lightweight insulating concrete, gypsum, cementitious wood fiber, wood or steel) or existing smooth or gravel surfaced BUR, modified bitumen or cap sheets.
     2. Flexible FAST Dual Cartridge Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates using a portable applicator.
     3. Flexible FAST Dual Tank Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates using a portable applicator.
     4. Flexible FAST 5 gallon Jug Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates, packaged for use with spray application rigs.
     5. OlyBond 500 BA - A two-component, polyurethane, low-rise expanding adhesive used to bond insulation to various substrates using a mechanical dispenser system.
     6. OlyBond Spot Shot - A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates using a portable applicator.
     7. One-Step: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates using a portable applicator.
  2. ETHYLENE, PROPYLENE, DIENE TERPOLYMER (EPDM) MEMBRANE

\*\* NOTE TO SPECIFIER \*\* Delete membrane types not required. Modify the included text as instructed.

* + 1. Sure-Seal Non-Reinforced Membrane: Cured, non-reinforced EPDM membrane meeting the requirements of ASTM D 4637 Type I.

\*\* NOTE TO SPECIFIER \*\* Delete attachment types not required.

* + - 1. Attachment Method: Fully adhered.
      2. Attachment Method: Mechanically fastened.
      3. Attachment Method: Ballasted.
      4. Color: Black.

\*\* NOTE TO SPECIFIER \*\* Select membrane thickness. Delete two of the next three paragraphs.

* + - 1. Membrane Thickness: 45 mil nominal.
      2. Membrane Thickness: 60 mil nominal.
      3. Membrane Thickness: 90 mil nominal.
      4. Sheet Dimensions:

\*\* NOTE TO SPECIFIER \*\* Select sheet width. 45 and 60 mil available up to 50 feet, 90 mil available up to 10 feet wide. Delete six of the next seven paragraphs based on membrane thickness.

* + - * 1. Width: 10 feet (3.05 m) maximum.
        2. Width: 16.5 feet (5.0 m) maximum.
        3. Width: 20 feet (6.1 m) maximum.
        4. Width: 25 feet (7.6 m) maximum.
        5. Width: 30 feet (9.14 m) maximum.
        6. Width: 40 feet (12.2 m) maximum.
        7. Width: 50 feet (15.25 m) maximum.
        8. Length: 100 feet (30.5 m) maximum.
      1. Performance:
         1. Tensile Strength: 1550 psi (10.7 MPa) minimum.
         2. Tear Resistance: 200 lbf/in (35 kN/m) minimum.
         3. Elongation: 480 percent.
    1. Sure-White Non-Reinforced Membrane: Cured, non-reinforced EPDM membrane meeting the requirements of ASTM D 4637 Type I.

\*\* NOTE TO SPECIFIER \*\* Delete attachment types not required.

* + - 1. Attachment Method: Fully adhered.
      2. Attachment Method: Mechanically fastened.
      3. Attachment Method: Ballasted.
      4. Color: White on Black.
      5. Membrane Thickness: 60 mil nominal.
      6. Membrane Thickness: 90 mil nominal.
      7. Sheet Dimensions:

\*\* NOTE TO SPECIFIER \*\* Select sheet width. Delete four of the next five paragraphs.

* + - * 1. Width: 10 feet (3.05 m) maximum.
        2. Width: 16.5 feet (5.0 m) maximum.
        3. Width: 20 feet (6.1 m) maximum.
        4. Length: 100 feet (30.5 m) maximum.
      1. Performance:
         1. Tensile Strength: 1685 psi (11.6 MPa) minimum.
         2. Tear Resistance: 200 lbf/in (35 kN/m) minimum.
         3. Elongation: 480 percent.
    1. Sure-Seal FleeceBACK Membrane: Cured, non-reinforced EPDM membrane with a 55 mil fleece bonded to the underside. Meets the requirements of ASTM D 4637 Type I.

\*\* NOTE TO SPECIFIER \*\* Delete attachment types not required.

* + - 1. Attachment Method: Fully adhered with FAST.
      2. Attachment Method: Fully adhered with Flexible FAST.
      3. Attachment Method: Aquabase Adhesive.
      4. Color: Black.

\*\* NOTE TO SPECIFIER \*\* Select membrane thickness. Delete two of the next three paragraphs.

* + - 1. Membrane Thickness: 100 mil nominal / 45 mil over fleece.
      2. Membrane Thickness: 115 mil nominal / 60 mil over fleece.
      3. Membrane Thickness: 145 mil nominal / 90 mil over fleece.
      4. Sheet Dimensions:
         1. Width: 10 feet (3.04 m) maximum.
         2. Length: 100 feet (30.5 m) maximum.
      5. Performance:
         1. Breaking Strength: 200 lbf ( 890 N) minimum.
         2. Tear Strength: 45 lbf (200 N) minimum.
         3. Elongation: 480 percent.
    1. Sure-White FleeceBACK Membrane: Cured, non-reinforced EPDM membrane with a 55 mil fleece bonded to the underside. Meets the requirements of ASTM D 4637 Type I.

\*\* NOTE TO SPECIFIER \*\* Delete attachment types not required.

* + - 1. Attachment Method: Fully adhered with FAST.
      2. Attachment Method: Fully adhered with Flexible FAST.
      3. Attachment Method: Aquabase Adhesive.
      4. Color: White on Black.

\*\* NOTE TO SPECIFIER \*\* Select membrane thickness. Delete two of the next three paragraphs.

* + - 1. Membrane Thickness: 100 mil nominal / 45 mil over fleece.
      2. Membrane Thickness: 115 mil nominal / 60 mil over fleece.
      3. Membrane Thickness: 145 mil nominal / 90 mil over fleece.
      4. Sheet Dimensions:
         1. Width: 10 feet (3.05 m) maximum.
         2. Length: 100 feet (30.5 m) maximum.
      5. Performance:
         1. Breaking Strength: 200 lbf (890 N) minimum.
         2. Tear Strength: 45 lbf (200 N) minimum.
         3. Elongation: 500 percent.
    1. Sure-Seal AFX Membrane: Cured, non-reinforced EPDM membrane with a 7.5 oz. per sq. yd. non-woven fleece backing bonded to the underside. Meets the requirements of ASTM D 4637 Type I.
       1. Attachment Method: Asphalt adhered.
       2. Color: Black.
       3. Membrane Thickness: 90 mil nominal / 45 mil over fleece.
       4. Membrane Thickness: 105 mil nominal / 60 mil over fleece.
       5. Sheet Dimensions:
          1. Width: 10 feet (3.04 m) maximum.
          2. Length: 100 feet (30.5 m) maximum.
       6. Performance:
          1. Breaking Strength: 200 lbf (890 N) minimum.
          2. Tear Strength: 45 lbf (200 N) minimum.
          3. Elongation: 480 percent.
    2. Sure-White AFX Membrane: Cured, non-reinforced EPDM membrane with a 7.5 oz. per sq. yd. non-woven fleece backing bonded to the underside. Meets the requirements of ASTM D 4637 Type I.
       1. Attachment Method: Asphalt adhered.
       2. Color: White on black.
       3. Membrane Thickness: 105 mil nominal / 60 mil over fleece.
       4. Sheet Dimensions:
          1. Width: 10 feet (3.04 m) maximum.
          2. Length: 100 feet (30.5 m) maximum.
       5. Performance:
          1. Breaking Strength: 200 lbf (890 N) minimum.
          2. Tear Strength: 45 lbf (200 N) minimum.
          3. Elongation: 480 percent.
    3. Sure-Tough Membrane: Cured, polyester fabric reinforced EPDM membrane meeting the requirements of ASTM D 4637 Type II.

\*\* NOTE TO SPECIFIER \*\* Delete attachment type not required.

* + - 1. Attachment Method: Fully adhered.
      2. Attachment Method: Mechanically fastened.
      3. Color: Black.

\*\* NOTE TO SPECIFIER \*\* Select membrane thickness. Delete one of the next two paragraphs.

* + - 1. Membrane Thickness: 45 mil nominal / 0.016 inches (0.4 mm) over scrim.
      2. Membrane Thickness: 60 mil nominal / 0.020 inches (0.5 mm) over scrim.
      3. Sheet Dimensions:

\*\* NOTE TO SPECIFIER \*\* Select specified sheet width(s). Delete two of the next three paragraphs.

* + - * 1. Width: 4.5 feet (1371 mm) maximum.
        2. Width: 8 feet (1371 mm) maximum.
        3. Width: 10 feet (1371 mm) maximum.

\*\* NOTE TO SPECIFIER \*\* Select maximum sheet length. 200 foot length only available with 45 mil, 10 foot wide rolls. Delete one of the next two paragraphs.

* + - * 1. Length: 100 feet (30.5 m) maximum.
        2. Length: 200 feet (30.5 m) maximum.
      1. Performance:
         1. Breaking Strength: 180 lbf (800 N) minimum.
         2. Tear Strength: 30 lbf (132 N) minimum.
         3. Elongation: 480 percent.
    1. Sure-Tough Membrane: Cured, polyester fabric reinforced EPDM membrane with enhanced puncture resistance meeting the requirements of ASTM D 4637 Type II.

\*\* NOTE TO SPECIFIER \*\* Delete attachment type not required.

* + - 1. Attachment Method: Fully adhered.
      2. Attachment Method: Mechanically fastened.
      3. Color: Black.
      4. Membrane Thickness: 75 mil nominal / 0.032 inches (0.8 mm) over scrim.
      5. Sheet Dimensions:
         1. Width: 10 feet (3.05 m) maximum.
         2. Length: 100 feet (30.5 m) maximum.
      6. Performance:
         1. Breaking Strength: 230 lbf (1023 N) minimum.
         2. Tear Strength: 70 lbf (311 N) minimum.
         3. Elongation: 500 percent.
  1. FLASHING ACCESSORlES
     1. Sure-Seal (black)/Sure-White (white) Pressure-Sensitive Pipe Seals with Factory-Applied TAPE on the deck flange are available for use with Sure-Seal/Sure-White Roofing systems.
     2. Sure-Seal/Sure-White Pressure-Sensitive Pourable Sealer Pocket: Pre-fabricated Pourable Sealer Pocket consisting of a 2 inch (51 mm) wide plastic support strip with Pressure-Sensitive, Factory-Applied, adhesive backed uncured Elastoform Flashing.
     3. Sure-Seal/Sure-White Pressure-Sensitive (PS) Inside/Outside Corner: A 7 inch by 9 inch precut 60-mil thick Elastoform Flashing with a 30-mil Factory-Applied TAPE.
     4. Sure-Seal/Sure-White Pressure-Sensitive (PS) Curb Flashing - A 60-mil thick, 20 inch (508 mm) wide cured EPDM membrane with 5 inch (126 mm) wide Factory-Applied Pressure-Sensitive TAPE along one edge to be used to flash curbs/skylights, etc.
     5. Sure-Seal 20" pressure-Sensitive Cured Flashing - A 20" wide (508 mm) cured EPDM membrane with Pressure-Sensitive TAPE the full width, factory applied, used to flash curbs/skylights, etc.
     6. Sure-Seal Pressure-Sensitive Overlayment Strip: A nominal 40-mil black, semi-cured EPDM membrane laminated to a nominal 35-mil cured, Factory-Applied TAPE for flashing gravel stops, metal edgings and Seam Fastening Plates.
     7. Sure-Seal/Sure-White Pressure-Sensitive Cured Cover Strip: Sure-Seal or Sure-White 60-mil cured EPDM membrane laminated to a nominal 35-mil cured Factory-Applied TAPE.
     8. Sure-Seal/Sure-White Pressure-Sensitive "T" Joint Covers: A factory cut uncured 60-mil thick EPDM flashing laminated to a nominal 35-mil Factory-Applied TAPE, used to overlay field splice intersections and to cover field splices at angle changes. Available in 6 inch by 6 inch and 12 inch by 12 inch for Sure-Seal applications, and 6 inch by 6 inch for Sure-White applications.
     9. Sure-Seal/Sure-White Pressure-Sensitive Elastoform Flashing: 60-mil thick uncured EPDM Flashing laminated to a 30-mil Factory-Applied Pressure-Sensitive TAPE used in conjunction with Sure-Seal Primer.
     10. Sure-Seal Pressure-Sensitive RUSS (Reinforced Universal Securement Strip):
         1. 6 inch (152 mm) RUSS: A nominal 6 inch (152 mm) wide, 45-mil thick reinforced EPDM membrane with a nominal 3 inch (76 mm) wide 30-mil thick cured synthetic rubber pressure-sensitive adhesive laminated to one edge. This product provides perimeter securement, and additional membrane securement at angle changes for Adhered, Ballasted, and Mechanically Fastened Roofing Systems.
         2. 9 inch (228 mm) RUSS: A nominal 9 inch (228 mm) wide, 45-mil thick reinforced EPDM membrane with a nominal 3 inch (76 mm) wide 30-mil thick cured synthetic rubber pressure-sensitive adhesive laminated to both edges. This product is used in place of narrow sheets to secure the membrane in the perimeter roof area. The use of this product allows field membrane to be utilized over the entire roof area.
     11. Sure-White Pressure-Sensitive RUSS (Reinforced Universal Securement Strip): 6 inch (152 mm) RUSS: A nominal 6 inch (152 mm) wide, 45-mil thick reinforced EPDM membrane with a nominal 3 inch (76 mm) wide 30-mil thick cured synthetic rubber pressure-sensitive adhesive laminated to one edge. This product provides perimeter securement, and additional membrane securement at angle changes for Adhered, and Mechanically Fastened Roofing Systems.

\*\* NOTE TO SPECIFIER \*\* Retain only products required on this project and delete all others.

* 1. CLEANERS, PRIMERS, ADHESIVES AND SEALANTS
     1. Carlisle Weathered Membrane Cleaner: Clear, solvent-based cleaner used to loosen and remove contaminants from the surface of exposed EPDM membrane prior to applying EPDM Primer.
     2. Sure-Seal SecurTAPE: 3 inch (76 mm) or 6 inch (152 mm) wide by 100 foot (30.5 M) long splice tape used for splicing adjoining sections of EPDM membrane.
     3. Sure-White SecurTAPE: A 3 inch (76 mm) or 6 inch wide (152 mm) wide by 100 foot (30.5 M) long, white colored splice tape used with Sure-White Systems.
     4. Sure-Seal HP-250 Primer: A solvent-based primer used to prepare the surface of EPDM membrane for application of Splice Tape or Pressure-Sensitive products.
     5. Low VOC EPDM and TPO Primer - A low VOC (volatile organic compound) primer (less than 250 grams/liter) for use with SecurTAPE or Pressure-Sensitive products.
     6. Sure-Seal/Sure-White Splicing Cement: A high-strength, butyl-based contact cement which is used for splicing adjoining sections of EPDM membrane (cured or uncured).
        1. Sure-Seal Splicing Cement: Black splicing cement for use with Sure-Seal (black) Roofing Systems.
        2. Sure-White Splicing Cement: White splicing cement used with Sure-White (white-on-black) Adhered Roofing Systems.
     7. Sure-Seal/Sure-White Lap Sealant: A heavy-bodied material (trowel or gun-consistency) used to seal the exposed edges of a membrane splice.
        1. Sure-Seal Lap Sealant: Black sealant for use with Sure-Seal (black) Roofing Systems.
        2. Sure-White Lap Sealant: White sealant for use with Sure-White (white-on-black) Roofing Systems.
     8. 90-8-30A Bonding Adhesive: A high-strength, yellow colored, synthetic rubber adhesive used for bonding Sure-Seal/Sure-White EPDM membranes to various surfaces.
     9. EPDM x-23 Low-VOC Bonding Adhesive: A Low-VOC (volatile organic compound) bonding adhesive (less than 250 grams/liter) used for bonding Sure-Seal/Sure-White EPDM membranes to various surfaces.
     10. Low-VOC Bonding Adhesive: A Low-VOC (volatile organic compound) bonding adhesive (less than 250 grams/liter) used for bonding Sure-Seal/Sure-White EPDM membranes to various surfaces.
     11. Solvent-Free EPDM Bonding Adhesive: A solvent free, odor free, non-flammable, low VOC Bonding Adhesive used to adhere EPDM to multiple substrates. This one-sided application adhesive requires adhesive to be applied to substrate only, when slopes are less than 1". Slopes greater than 1" or vertical substrates may require 2-sided application.
     12. Flexible FAST Adhesive: A spray or extruded applied, two-component, polyurethane, low-rise expanding foam adhesive used to securely bond FleeceBACK membranes to a variety of substrates.
     13. Flexible FAST Dual Cartridge Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive used to securely bond FleeceBACK membranes to a variety of substrates. The adhesive is extrusion applied 4 inch (102 mm), 6 inch (152 mm) or 12 inch (305 mm) on center (depending on project conditions) using a portable applicator.
     14. Flexible FAST Dual Tank Adhesive: A spray applied, two-component, polyurethane construction grade, low-rise expanding adhesive used to securely bond FleeceBACK membranes to a variety of substrates.
     15. Flexible FAST 5-gallon Jug Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates, packaged for use with low pressure urethane equipment.
     16. Aqua Base 120 Bonding Adhesive: a semi pressure-sensitive water based adhesive. Used as a one-sided, wet lay-in adhesive with Sure-Seal, or Sure-White FleeceBACK 100 or 115 mil membranes or as a two-sided contact adhesive with non-fleece backed Sure-Seal, Sure-Tough, or Sure-White EPDM membranes.
     17. Water Cut-Off Mastic: A one-component, low viscosity, self wetting, Butyl blend mastic used as a compression sealing agent between EPDM membranes and applicable substrates.
     18. Two-Part Pourable Sealer: A black, two-component, solvent-free, polyurethane based product used for tie-ins and as a sealant around hard-to-flash membrane penetrating objects such as clusters of pipes and for a daily seal when the completion of flashings and terminations cannot be completed by the end of each work day. Can also be used for attaching lightning rod bases and ground cable clips to the membrane surface.
     19. Sure-Seal/Sure-White One-Part Pourable Sealer: A one-component, moisture curing, elastomeric polyether sealant used as a sealant around hard-to-flash penetrations such as clusters of pipes, and is available in white or black.
     20. Universal Single-Ply Sealant: A 100 percent solids, solvent free, one-part, polyether sealant that provides a weather tight sealant to a variety of building substrates; used as a termination bar sealant. Available in white only.
     21. CCW 702 Primer and 702LV Primer (Low VOC) - A single component, solvent based, high-tack primer used to provide maximum adhesion between Carlisle 725TR Air and Vapor Barrier and an approved substrate. Applied by spray or long nap roller with a coverage rating ranging from approximately 300 to 350 square feet per gallon on smooth finishes (i.e., concrete) to 75 square feet per gallon on porous surfaces (i.e., Dens-Deck Prime gypsum board). Available in 5-gallon containers. CCW 702LV Primer contains less than 250g/L VOCs and meets South Coast Air Quality Management District (SCAQMD) and Leadership in Energy and Environmental Design (LEED) Requirements for Volatile Organic Compounds.
     22. CCW 702 WB - a high-tack, water-based contact adhesive for promoting adhesion of Carlisle air/vapor barrier membranes and an approved substrate (i.e., concrete, Dens-Deck Prime and Securock). Applied by roller, brush or spray with an application rate of approximately 200 sq. ft. per gallon. Available in 5-gallon containers. CCW 702 WB Primer contains 57g/L VOCs and meets South Coast Air Quality Management District (SCAQMD) and Leadership in Energy and Environmental Design (LEED) Requirements for Volatile Organic Compounds.
     23. CAV-GRIP III Low-VOC Aerosol Contact Adhesive/Primer: a low-VOC, methylene chloride-free adhesive that can be used for a variety of applications including: Priming unexposed asphalt prior to applying Flexible FAST Adhesive, adhering Sure-Seal EPDM, horizontally, for the field of the roof, and for adhering Sure-Seal FleeceBACK and Sure-Seal EPDM membrane to vertical walls. Coverage rate is approximately 2,000-2,500 sq. ft. per 40 lb cylinder and 4,000-5,000 sq. ft. per 85 lb cylinder as a primer, in a single-sided application and 750 sq. ft. per 40 lb cylinder and 1,500 sq. ft. per 85 lb cylinder as an adhesive for vertical walls, in a double-sided application; 1,000 sq. ft. per 40 lb cylinder and 2,000 sq. ft. per 85 lb cylinder as an adhesive, horizontally, for the field of the roof, in a double-sided application.

\*\* NOTE TO SPECIFIER \*\* Retain the next article only if insulation is asphalt adhered.

* 1. BITUMEN
     1. Hot Asphalt: Meets or exceeds requirements of ASTM D 312:

\*\* NOTE TO SPECIFIER \*\* Select required asphalt type. Delete two of the next three paragraphs.

* + - 1. Type: Type III.
      2. Type: IV.
      3. Type: SEBS.
    1. Cut-Back Asphalt Primer: ASTM D 41 primer for structural concrete decks, existing smooth BUR, mineral surfaced cap sheet, or modified bitumen membranes prior to mopping.
  1. FASTENING COMPONENTS

\*\* NOTE TO SPECIFIER \*\* Retain only fastening components required on this project and delete all others.

* + 1. HP Fastener: Threaded, black epoxy electro-deposition coated (E-Coat) fastener for use with steel, wood plank or oriented strand board (OSB).
    2. InsulFast Fasteners: Threaded, #12 fastener with #3 Phillips head used with 3 inch (76 mm) diameter Insulation Plates. For insulation attachment into steel or wood decks.
    3. Pre-Assembled ASAP Fasteners: InsulFast Fastener and pre-assembled 3 inch (76 mm) diameter Plastic Insulation Plate for insulation attachment on adhered and mechanically-fastened roofing systems.
    4. CD-10 Concrete Fastener: A hammer-driven, non-threaded, black epoxy electro-deposition coated (E-Coat) fastener for use with structural concrete decks rated 3,000 psi or greater.
    5. HD 14-10 Concrete Fastener: A #14 threaded fastener used for minimum 3,000 psi concrete decks.
    6. HP-NTB Fastener: A non-penetrating, plastic fastener and plate for cementitious wood fiber and gypsum.
    7. Lite-Deck Fastener: An oversized diameter metal fastener and associated 3 inch diameter Lite-Deck metal plate for use on adhered roofing systems to attach insulation to dense gypsum decks, cementitious wood fiber and lightweight insulating concrete.
    8. HP-X Fasteners: Heavy-duty #15 threaded fastener with a Phillips head for adhered assemblies where increased pullout resistance is necessary for steel and wood decks.
    9. HP Purlin Fastener: Hex-head, threaded, self-drilling, non-threaded, black epoxy electro-deposition coated (E-Coat) fastener used for membrane/RUSS securement into structural purlins.
    10. HP Term Bar Nail-In: A 1 1/4 inch (32 mm) long expansion anchor with threaded drive pin used for fastening Sure-Seal Termination Bar or Seam Fastening Plates to concrete, brick or block walls.
    11. Dual Prong Fasteners: A factory pre-assembled, 1.8 inch long fastener consisting of a precision tube formed from galvanized (G-90) coated steel, a 2.7 inch disk formed from Galvalume (AX-55) coated steel and a locking staple of high tensile steel wire used to secure base sheets to fibrous cement, lightweight concrete and gypsum providing 70 pounds of pullout resistance is achieved.
    12. HP XTRA: Oversized diameter 0.315 inch (8 mm) steel threaded fastener for use with 22 gauge steel decks for maximum pullout.
    13. HP Polymer Seam Plate: A 2 inch (51 mm) diameter plastic barbed fastening plate used for membrane and Pressure-Sensitive RUSS securement for Mechanically Fastened Roofing Systems over steel roof decks.
    14. HP XTRA Polymer Seam Plates: 2 3/8 inch (61 mm) diameter plastic fastening plate with barbs on the underside, allowing a wider fastening pattern while maintaining pullout resistance.
    15. Seam Fastening Plate: 2 inch (51 mm) diameter metal plate for insulation, membrane and RUSS attachment.
    16. Insulation Fastening Plate: Nominal 3 inch (76 mm) diameter FM approved metal plate used for insulation attachment.
    17. Polymer Batten Bar: A 1 inch wide by 0.05 inch thick (25 mm x 1.3 mm) polymer bar pre-punched 6 inches (152 mm) on center for membrane securement.
    18. Sure-Seal Metal Fastening Bar: 1 inch by 10 foot long (25 mm x 3048 mm) Galvalume-coated steel fastening bar pre-punched 6 inches (152 mm) on center for membrane securement on Mechanically Fastened Roofing Systems.
  1. EDGINGS AND TERMINATIONS
     1. SecurEdge 200: A snap-on edge system consisting of a 24 gauge galvanized metal water dam. Finish as noted on the Finish Schedule of the Contract Drawings.
     2. SecurEdge 300: A 24 gauge galvanized metal water dam. Finish as noted on the Finish Schedule of the Contract Drawings.
     3. SecurEdge 400: A 24 gauge galvanized metal water dam. Finish as noted on the Finish Schedule of the Contract Drawings.
     4. SecurEdge 2000: An anchor bar roof edge fascia system consisting of 0.100 inch (2.5 mm) thick extruded aluminum bar, corrosion resistant stainless steel fasteners and snap-on fascia cover.
     5. SecurEdge 3000: A metal anchor bar fascia system consisting of a 20 gauge steel retainer bar, corrosion resistant fasteners and aluminum or 24 gauge steel snap-on fascia cover.
     6. SecurEdge 4000: A metal anchor bar fascia system consisting of a 20 gauge steel retainer bar, corrosion resistant fasteners and aluminum or 24 gauge steel snap-on fascia cover.
     7. Sure-Seal Drip Edge: A 22 gauge pre-punched 90-degree angle cleat and 12 foot (3658 mm) long fascia sections. Kynar 500 or aluminum finish as noted on the Finish Schedule of the Contract Drawings.
     8. SecurEdge 200 Coping: An anchor cleat with pre-slotted holes, a concealed joint cover, and 10 or 12 foot sections of coping cap. Kynar 500 finish as noted on the Finish Schedule of the Contract Drawings.
     9. SecurEdge 300 Coping: An anchor cleat with pre-slotted holes, a concealed joint cover, and 10 or 12 foot sections of coping cap. Kynar 500 finish as noted on the Finish Schedule of the Contract Drawings.
     10. SecurEdge 400 Coping: An anchor cleat with pre-slotted holes, a concealed joint cover, and 10 or 12 foot sections of coping cap. Kynar 500 finish as noted on the Finish Schedule of the Contract Drawings.
     11. Sure-Seal Ballast Retaining Bar: A ballast retaining perimeter securement system comprised of a slotted extruded aluminum retention bar with integrated compression fastening strip.
     12. Sure-Seal Termination Bar: 1 inch (13 mm) wide, .098 inch (2.5 mm) thick extruded aluminum bar pre-punched 6 inches (152 mm) on center with sealant ledge to support Lap Sealant.
     13. SecurEdge Term Bar Fascia: A 1.75" wide formed aluminum termination bar with pre-slotted fastening holes for ease of locating and installing. The decorative cover is available in 0.040" aluminum or 24-gauge galvanized steel. SecurEdge Term Bar Fascia is manufactured in 12' lengths for fewer joints/seams, fewer sections to handle and faster installation.

\*\* NOTE TO SPECIFIER \*\* Delete the next article if roof garden is not specified. Retain only products required on this project.

* 1. ROOF GARDEN COMPONENTS
     1. Drainage Components:
        1. Carlisle's MiraDRAIN 9800 Drainage Board: High impact polystyrene core with "cups" and pierced holes allowing water retention and drainage. A non-woven polypropylene filter fabric is bonded to the retention side of the molded core to prevent passage of particles into the water reservoirs. Designed to retain water in Ultra-Extensive and Extensive Roof Gardens while allowing excess water to the drainage system. Installed over CCW 200V or 300HV protection fabric.
           1. Panel Thickness: 0.04 inches (1.02 mm)
           2. Water Flow Rate: 95 gpm/ sqft in accordance with ASTM D 4491.
        2. CCW MiraDRAIN HC Drainage Board: High flow drainage composite consisting of a high impact polystyrene core with a non-woven polypropylene filter fabric on the top and bottom sides of the board to prevent passage of particles into the drainage core. Used in Intensive (deep) roof gardens as an alternative to drainage gravel and protection fabric beneath the growth medium.
           1. Panel Thickness: 1.0 inches (25 mm)
           2. Water Flow Rate: 140 gpm/ sqft in accordance with ASTM D 4491.
        3. MiraDRAIN G4 Roof Garden Drainage Composite: Filter fabric, moisture retention mat, drainage mat and heavy-duty protection fabric combined into a single, component specifically designed for vegetated roofs.
           1. Panel Thickness: 1.21 inches (30.1 mm).
           2. Water Flow Rate: 75 gpm/ sf in accordance with ASTM D 4491.
     2. Protective Mats:
        1. Protection Fabric: Carlisle CCW 200V - 12 oz/sq yd needle punched, non-biodegradable, non-woven polypropylene fabric stabilized to resist soil chemicals, mildew and insects used in conjunction with the Green Grid Trays only.
        2. Protection Fabric: Carlisle CCW 300HV - 16 oz/sq yd needle punched, non-biodegradable, non-woven polypropylene fabric stabilized to resist soil chemicals, mildew and insects.
        3. Root Barrier: 40 mil non-reinforced polypropylene geomembrane sheet specifically formulated for use in below grade applications to resist root growth and soil bacteria. Used in Intensive (deep) and Extensive (medium depth) Roof Garden Systems.
        4. Biobarrier: A water and air permeable non-woven root barrier designed to inhibit the growth of plants roots through low-level emission of synthesized plant hormones.
        5. Moisture Retention Mat: Nominal 24.3 oz/sq yd, 0.3 inch (7.6 mm) thick needle-punched, recycled synthetic fiber mat designed to retain moisture in Ultra-Extensive and Extensive Roof Gardens.
     3. Hardscape:

\*\* NOTE TO SPECIFIER \*\* Retain only components required on this project and Delete all others.

* + - 1. Individual Concrete Plaza Pavers - 2 foot by 2 foot by 2 inches thick (610 x 610 x 51 mm) precast concrete pavers weighing a minimum of 18 psf with a minimum compressive strength of 6500 psi.
      2. Paver Pedestals: Rubber paver pedestals to elevate the surface of the pavers above the roof membrane and promote positive drainage and protection from freeze/thaw.
      3. Stone Ballast: Nominal 1 1/2 inch (39 mm) diameter rounded water worn gravel which conforms with ASTM D 448, gradation size #4, applied at a minimum of 10 pounds per square foot.
      4. Other: All Roof Garden products not specified in this section such as concrete curbs, landscape lumber or other desired landscape products used to transition between Ultra-Extensive, Extensive and Intensive Roof Garden areas to act as a "growth media stop" must be approved specifically by the Architect prior to installation.
    1. Greenscape:
       1. Growing Medium: A mixture of mineral and organic soil components as selected by the landscape architect/designer or other appropriate landscape professional for the intended vegetation and climate.
       2. Vegetation: Sedum, grasses, herbs, flowers, shrubs, small trees and other greenscape items as selected by the landscape architect/designer or other appropriate landscape professional and intended for the garden type (Intensive, Extensive or Ultra-Extensive), climate and soil selected.
       3. Sedum Tile: Fully pre-vegetated coconut fiber mat designed to provide immediate full vegetative coverage.
       4. Sedum Clippings and Gel: Un-rooted sedum cuttings dispersed on the surface of growth media in conjunction with a water retention gel to aid in the plant rooting process.
       5. Plugs: Plants pre-grown into soil "plugs" to be inserted into the surface of the growth media. Typically delivered in 10 inch by 20 inch trays containing 24 - 72 individual plants.

\*\* NOTE TO SPECIFIER \*\* Select ballast where ballast applied system is specified. Retain only ballast type(s) required on this project and delete all others. Delete the entire article if not required.

* 1. BALLAST
     1. Rounded Water-Worn Gravel:

\*\* NOTE TO SPECIFIER \*\* Select ballast size. Delete one of the next two paragraphs.

* + - 1. Nominal 1 1/2 inch (38 mm) rounded water-worn gravel which conforms to gradation #4 when sized in accordance with ASTM D 448 method of sizing. Coverage rate shall be no less than 1000 pounds per 100 square feet and gravel must be evenly distributed to maintain an average of 10 pounds per square foot.
      2. Nominal 2 1/2 inch (64 mm) rounded water-worn gravel which conforms to gradation #1 or #2 when sized in accordance with ASTM D 448 method of sizing. Coverage rate shall be no less than 1300 pounds per 100 square feet and gravel must be evenly distributed to maintain an average of 13 pounds per square foot.
    1. Crushed Stone:
       1. Shall conform to the gradations noted for rounded water-worn gravel and must be installed in conjunction with Sure-Seal HP Protection Mat.

\*\* NOTE TO SPECIFIER \*\* Select stone size. Delete one of the next two paragraphs.

* + - * 1. Nominal 1 1/2 inch (38 mm).
        2. Nominal 2 1/2 inch (64 mm).
    1. Individual Concrete Pavers:

\*\* NOTE TO SPECIFIER \*\* Select ballast size. Delete one of the next two paragraphs.

* + - 1. Individual pavers weighing a minimum of 18 pounds (8.16 kg) per square foot may be substituted for nominal 1 1/2 inch (38 mm) stone.
      2. Individual pavers weighing a minimum of 22 pounds (10 kg) per square foot may be substituted for nominal 2 1/2 inch (64 mm) stone.
      3. Pavers must be a maximum of two feet square. Unless otherwise required by Carlisle, pavers must weigh no more than 80 pounds per unit to allow for easy removal and replacement.
      4. Individual pavers with a surface other than a steel trowel finish as approved by Carlisle must be installed over a protective mat and must be accepted by Carlisle prior to installation.
      5. Pavers must be loose laid and butted together with no gaps greater than 1/2 inch (13 mm).

\*\* NOTE TO SPECIFIER \*\* Elevating pavers on pedestals may increase life expectancy, reduce freeze/thaw effects and promote more positive drainage. Retain one of the next two paragraphs.

* + - 1. Install Pavers over 4 inch by 4 inch (102 mm x 102 mm) sections of Sure-Seal Walkway Rolls or approved pedestals with HP Mat or HR Mat.
      2. Install pavers over EPDM slipsheet.
    1. Lightweight Interlocking Pavers:
       1. Upon approval by the membrane manufacturer, lightweight interlocking pavers, minimum 10 pounds (4.5 kg) per square foot may be substituted for nominal 1 1/2 inch or 2 1/2 inch stone and must be installed over Sure-Seal HP Protective Mat or the paver manufacturer's recommended matting.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly prepared.
      2. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
      3. Do not commence work until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment.
      4. A vapor retarder / temporary roof (Carlisle VapAir Seal 725TR Air & Vapor Barrier/Temporary Roof or Carlisle VapAir Seal MD Air & Vapor Barrier) may be applied to protect the inside of the structure prior to the roof system installation.

\*\* NOTE TO SPECIFIER \*\* Insert project specific information regarding insulation types and attachment. Add or remove layers as necessary, or delete the entire article if not required.

* 1. INSULATION - SYSTEM DESIGN
     1. Base Layer:
        1. Type: \_\_\_\_\_\_\_\_\_\_\_\_.
        2. Thickness: \_\_\_\_\_\_ inches (\_\_\_ mm).
        3. Attachment Method: \_\_\_\_\_.
     2. Top Layer:
        1. Type: \_\_\_\_\_\_\_\_\_\_\_\_.
        2. Thickness: \_\_\_\_\_\_ inches (\_\_\_ mm).
        3. Attachment Method: \_\_\_\_\_.
     3. Tapered System:
        1. Type: \_\_\_\_\_\_\_\_\_\_\_\_.
        2. Field Slope: \_\_\_\_ inch per foot.
        3. Sump Slope: \_\_\_\_ inch per foot.
        4. Cricket Slope: \_\_\_\_ inch per foot.
        5. Attachment Method: \_\_\_\_\_.
  2. INSULATION PLACEMENT
     1. Install insulation or membrane underlayment in multiple layers over the substrate with boards butted tightly together with no joints or gaps greater than 1/4 inch (6 mm). Stagger joints both horizontally and vertically.
     2. Secure insulation to the substrate with the required mechanical fasteners or insulation adhesive in accordance with the manufacturer's current application guidelines.
     3. Do not install wet, damaged or warped insulation boards.
     4. Stagger joints in one direction unless joints are to be taped. Install insulation boards snug. Gaps between board joints shall not exceed 1/4 inch (6 mm). Fill all gaps in excess of 1/4 inch (6 mm) with same insulation material.
     5. Wood nailers must be at least 3 1/2 inches (89 mm) wide or 1 inch (25 mm) wider than adjacent metal flange. Thickness must equal that of insulation but not less than 1 inch (25 mm) thickness.
     6. Miter and fill the edges of the insulation boards at ridges, valleys and other changes in plane to prevent open joints or irregular surfaces. Avoid breaking or crushing of the insulation at the corners.
     7. Do not install any more insulation than will be completely waterproofed each day.
  3. INSULATION ATTACHMENT

\*\* NOTE TO SPECIFIER \*\* Delete the next paragraph if a Ballast Applied system is specified.

* + 1. Securely attach insulation to the roof deck for Adhered or Mechanically Fastened Roofing Systems. Attachment must have been successfully tested to meet or exceed the calculated uplift pressure required by the International Building Code (ASCE-7) or ANSI/SPRI WD-1.

\*\* NOTE TO SPECIFIER \*\* Delete the next paragraph if a Ballast Applied or Mechanically Attached system is specified. FM Loss Prevention Data Sheet 1-29 no longer uses 50 and 75 percent increased fastener density in perimeter and corner areas for Adhered assemblies above FM 1-75.

* + 1. Enhance the perimeter and corner areas in accordance with the International Building Code (ASCE-7) or ANSI/SPRI WD-1.

\*\* NOTE TO SPECIFIER \*\* Delete the next paragraph if asphalt applied insulation is not specified

* + 1. Install insulation layers, maximum 4 feet by 4 feet (1220 mm by 1220 mm) board size, in a full and uniform mopping of hot asphalt applied at the rate of 25 lb/square (1.2 kg/sm). Stagger the joints of additional layers in relation to the insulation joints in the layer(s) below by a minimum of 6 inches (152 mm).

\*\* NOTE TO SPECIFIER \*\* Delete the next paragraph if adhesive applied insulation is not specified

* + 1. Install insulation layers, maximum 4 feet by 4 feet (1220 mm by 1220 mm), applied with adhesive, coverage rate as necessary to achieve the specified attachment and uplift rating. Press each board firmly into place after adhesive develops strings when touched, typically 1-1/2 to 2 minutes after adhesive was applied, and roll with a weighted roller. Add temporary weight and use relief cuts to ensure boards are well adhered. Stagger the joints of additional layers by a minimum of 6 inches (152 mm).

\*\* NOTE TO SPECIFIER \*\* Delete the next paragraph if a Ballast Applied system is not specified.

* + 1. For ballast attachment loose lay insulation. Where necessary, minimal fastening may be performed to inhibit movement. Fastening plates will require an overlayment of small sections of cured reinforced EPDM membrane in conjunction with Lap Sealant to cover the fastener head and insulation fastening plate.

\*\* NOTE TO SPECIFIER \*\* Retain the next article if ONLY if membrane is FULLY ADHERED

* 1. MEMBRANE PLACEMENT AND ATTACHMENT (Fully Adhered)
     1. Unroll and position membrane without stretching. Allow the membrane to relax for approximately 1/2 hour before bonding. Fold the sheet back onto itself so half the underside of the membrane is exposed.
     2. Apply the Bonding Adhesive in accordance with the manufacturer's published instructions, to both the underside of the membrane and the substrate. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch.
     3. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded half of the membrane sheet with a soft bristle push broom to achieve maximum contact.
     4. Fold back the unbonded half of the membrane sheet and repeat the bonding procedure.
     5. Install adjoining membrane sheets in the same manner, overlapping edges appropriately to provide for the minimum splice width. It is recommended that all splices be shingled to avoid bucking of water.

\*\* NOTE TO SPECIFIER \*\* Retain the next article if ONLY if membrane is FleeceBACK FULLY ADHERED

* 1. MEMBRANE PLACEMENT AND ATTACHMENT (FleeceBACK Fully Adhered)
     1. Position and unroll successive sheets and align to provide for a minimum 3 inch (76 mm) wide splice.
     2. Fold adjacent sheets in half lengthwise to expose an approximate 10 foot (3046 mm) wide substrate area.
     3. Membrane which will have the adjacent sheet spliced over it should be adhered to the substrate first. In this fashion, selvage edge splice area will not be contaminated by setting splice edge into the FAST or Flexible FAST Adhesive.
     4. Spray or extrude FAST or Flexible FAST Adhesive onto the substrate and allow to foam up approximately 1/8 inch (3 mm). Wait for the adhesive to achieve "string" when a small object is lifted out if the adhesive.
     5. Place the membrane into adhesive after adhesive develops strings when touched, typically 1-1/2 to 2 minutes after adhesive was applied, and roll with a 150 lb (68 kg) segmented weighted roller.
     6. Apply FAST Adhesive to the substrate and continue process described above until all sheets are fully bonded, allowing for necessary splice overlaps at selvage edges. At end laps (along the width of the sheet) membrane shall be butted together which will be overlaid with 6 inch wide Pressure-Sensitive Cured Cover Strip or Pressure-Sensitive Overlayment Strip.

\*\* NOTE TO SPECIFIER \*\* Retain the next article if ONLY if membrane is MECHANICALLY ATTACHED.

* 1. MEMBRANE PLACEMENT AND ATTACHMENT (Mechanically Attached)
     1. Unroll and position membrane without stretching. Allow the membrane to relax for approximately 1/2 hour prior to attachment. Provide and secure both perimeter and field membrane sheets in accordance with the manufacturer's most current specifications and details.
     2. Secure the membrane along the pre-printed blue line approximately 3 inches (76 mm) from the edge of the membrane sheet with the required Sure-Seal Fastener and Polymer Seam Plate or Seam Fastening Plate spaced a maximum of 12 inches (305 mm) on center. The minimum distance between the edge of the fastening plate and the edge of the membrane must be 2 inches (51 mm).
     3. As an alternate to the use of fastening plates, Sure-Seal Metal Fastening Bars may be used for membrane securement.
     4. Position adjoining field membrane sheets to allow a minimum overlap of 6 inches at locations where Fastening Plates are located (along the length of the membrane); at the same time overlap end roll sections (width of the membrane) a minimum of 3 inches.

\*\* NOTE TO SPECIFIER \*\* Retain the next article if ONLY if membrane is BALLAST APPLIED.

* 1. MEMBRANE PLACEMENT AND ATTACHMENT (Ballast Applied)
     1. Unroll and position membrane without stretching. Allow the membrane to relax for approximately 1/2 hour prior to splicing.
     2. Install adjoining membrane sheets in the same manner, overlapping edges appropriately to provide for the minimum splice width. It is recommended that all splices be shingled to avoid bucking of water.

\*\* NOTE TO SPECIFIER \*\* Retain the next article if ONLY if membrane is ASPHALT ADHERED.

* 1. MEMBRANE PLACEMENT AND ATTACHMENT (Asphalt Adhered)
     1. General:
        1. Store membrane in a dry area to prevent absorption of moisture in the fleece backing. If moisture is present, it must be removed with a wet-vac system and the membrane must be allowed to fully dry prior to membrane adhesion.
        2. The temperature of the asphalt during application shall be within 25 F (4 C) from the Equiviscous Temperature (EVT). The manufacturer's heating instructions (i.e., maximum heating temperature, prolonged storage temperature guidelines) must be strictly followed.
        3. Apply asphalt at a coverage rate of 18-22 pounds per square (100 square feet). It is important that "heavy spots" of asphalt, typically occurring at mopping overlaps or where the mop is first positioned, be avoided. At these areas, the asphalt must be spread evenly to avoid a heavy coverage rate that can cause asphalt saturation of the fleece backing. Asphalt saturation of the fleece must be avoided.
        4. If spreaders are used to apply asphalt, care must be taken to ensure the proper coverage rate is maintained. Do not overlap asphalt layers at multiple pass lines since the heavy coverage rate occurring at these overlapping areas must be avoided.
        5. Mopping the membrane directly to Polyisocyanurate insulation is not permitted. Carlisle HP Recovery Board must be used as an overlayment when insulation is specified. Carlisle Modified Base Sheet may be used in place of the Carlisle HP Recovery Board when fastened to a steel or wood deck following manufacturer's requirements for a maximum 25-year warranty.
     2. When positioning membrane along the length for tape or adhesive splices, allow the fleece backing to extend approximately 1/2 inch (13 mm) above adjoining membrane to avoid direct contact between EPDM membrane and hot asphalt.
     3. When using a mop to apply asphalt, position the membrane over the substrate overlapping adjacent sheets to accommodate membrane splicing and fold in half lengthwise to expose the substrate and the back side of the membrane (full width of the membrane by approximately half the length).
     4. Beginning at the membrane fold, apply asphalt to the full width of the membrane extending a maximum of 3 to 6 feet while rolling the membrane into the asphalt immediately. The asphalt temperature at the time of membrane adhesion must be above 350 F (176.7 C). Continue to apply asphalt for the full width of the membrane extending 3 to 6 feet (914 - 1828 mm) at a time while embedding the membrane into the asphalt until the entire half of the sheet is adhered. Fold back the unbonded half of the membrane and repeat the bonding procedures identified above.
     5. When using spreaders to apply asphalt, the membrane is folded widthwise dependent on the size of the spreader (36 to 57 inches wide); i.e., if a 36 inch wide spreader is used, the membrane will be folded to expose approximately a 36 inch wide by 50 foot long area. After the asphalt is applied in a single pass, the membrane is rolled into the asphalt. After mopping the membrane, apply asphalt to the remaining substrate area in single passes and continue to bond membrane as identified above.
        1. Membrane must be embedded into asphalt immediately after each spreader pass to ensure asphalt temperature is at least 350 F (176.7 C) at the time of membrane embedment.
        2. Take care that the asphalt is not dropped directly on the back of the membrane. Use a mop to spread asphalt at pass lines and under sheet folds to prevent a heavy coverage rate.
     6. After membrane mopping, immediately after adhesion, brush down the sheet with a soft bristled broom using light to medium pressure. Do not use weighted rollers or heavy pressure when brooming the membrane to avoid asphalt saturation of the fleece.

\*\* NOTE TO SPECIFIER \*\* Delete the next paragraph if Adhesive spliced seams are not specified

* 1. MEMBRANE SPLICING (Adhesive Splice)
     1. Fold the top sheet back and clean the dry splice area (minimum 3 inches wide) of both membrane sheets by scrubbing with clean natural fiber rags saturated with Splice Cleaner or HP-250 Primer. When using Sure-Seal (black) PRE-KLEENED membrane, cleaning the splice area is not required unless contaminated with field dirt or other residue.
     2. Apply Splicing Cement in accordance with the manufacturer's current application guidelines, and roll the top sheet onto the mating surface.
     3. Roll the splice with a 2 inch wide steel roller and wait at least 2 hours before applying Lap Sealant to the splice edge following the manufacturer's requirements.
     4. Field splices without In-Seam Sealant must be overlaid with uncured flashing.

\*\* NOTE TO SPECIFIER \*\* Delete the next paragraph if taped seams are not specified

* 1. MEMBRANE SPLICING (Tape Splice)
     1. Overlap adjacent sheets and mark a line 1/2 inch out from the top sheet.
     2. Fold the top sheet back and clean the dry splice area (minimum 2 1/2 inches (64 mm wide) of both membrane sheets with Sure-Seal Primer as required by the membrane manufacturer.
     3. Where Splice Tape is not Factory-Applied, apply Splice Tape to bottom sheet with the edge of the release film along the marked line. Press tape onto the sheet using hand pressure. Overlap tape roll ends a minimum of 1 inch (13 mm).
     4. Remove the release film and press the top sheet onto the tape using hand pressure.
     5. Roll the seam toward the splice edge with a 2 inch (51 mm) wide steel roller.
     6. Install Pressure-Sensitive "T" Joint Cover, a 6 inch wide (152 mm) section of Pressure-Sensitive Elastoform Flashing over all field splice intersections.
     7. When using non-Pressure-Sensitive Elastoform Flashing or Elastoform Flashing, seal edges of flashing with Lap Sealant.
     8. The use of Lap Sealant with tape splices is optional except at tape overlaps and cut edges of reinforced membrane where Lap Sealant is required.
  2. FLASHING
     1. Wall and curb flashing shall be cured EPDM membrane. Continue the deck membrane as wall flashing where practicable.
     2. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

\*\* NOTE TO SPECIFIER \*\* Delete the next article if a ballast applied system is not specified.

* 1. BALLASTING
     1. Install ballast in accordance with the manufacturer's installation instructions.
     2. Install ballast evenly without bare spots to provide complete coverage over the membrane.
     3. When specified, overlap HP Protective Mat a minimum of 6 inches prior to ballast or paver installation.
     4. Comply with published ANSI (American National Standards Institute) ANSI/SPRI RP-4 guidelines concerning applicable coverage rates.
  2. WALKWAYS
     1. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the Contract Drawings.
     2. Adhere walkways pads to the EPDM membrane in accordance with the manufacturer's current application guidelines.

\*\* NOTE TO SPECIFIER \*\* Delete the entire next article if Roof Gardens are not specified. Retain only the products required for the roof project specified in this section.

* 1. ROOF GARDEN COMPONENT APPLICATION
     1. General:
        1. Inspection:
           1. Membranes shall be adhered to minimum 1/2 inch Carlisle DensDeck Prime, 1/2 inch Carlisle SecurRock, or to structurally sloped concrete deck.
           2. A water test is required to ensure the waterproof integrity of the membrane system. Inspect for leaks and repair membrane if defects are found. Retest after repairs have been made.
           3. Sweep the surface of the membrane to remove all debris and loose or foreign material.
     2. Installation:
        1. Shallow Assembly - up to 4 inches in depth
           1. Carlisle Roofing Membrane
           2. CCW MiraDrain G4 Drainage Composite
           3. Carlisle Engineered Growth Media
           4. Vegetated Sedum Tiles, Sedum Plugs, or Sedum Cuttings with Carlisle Moisture Retention Gel
        2. Medium Assembly - 4 inches to 8 inches in depth
           1. Carlisle Roofing Membrane
           2. CCW 300HV
           3. 40 mil non-reinforced Geomembrane or Biobarrier
           4. CCW MiraDrain G4 Drainage Composite
           5. Carlisle Engineered Growth Media
           6. Vegetated Sedum Tiles, Sedum Plugs, or Sedum Cuttings with Carlisle Moisture Retention Gel
        3. Deep Assembly - greater than 8 inches in depth
           1. Carlisle Roofing Membrane
           2. Insulfoam, Foamular or DOW Polystyrene Insulation (25 to 60 psi)
           3. CCW 300HV
           4. 40 mil non-reinforced Geomembrane or Biobarrier
           5. CCW MiraDrain G4 Drainage Composite
           6. Carlisle Engineered Growth Media
           7. Vegetated Sedum Tiles, Sedum Plugs, or Sedum Cuttings with Carlisle Moisture Retention Gel
     3. G4 application: Unroll and install to provide a minimum 2 inch side overlap. Butt the end laps next to each other.
     4. Protection Fabric: Unroll directly over the membrane and provide a minimum 2 inch (51 mm) side and end overlap.
     5. Insulation: Loose apply insulation directly over the membrane with all joints tightly butted. Extend insulation up walls and curbs to the height of the growth media layer.
     6. Root Barrier:
        1. On Extensive garden systems, position root barrier loose-laid over the protection fabric. Overlap adjacent sheets a minimum of 2 inches (51 mm) and seam in accordance with manufacturer's current recommendations for the field conditions and membrane specified.
        2. On Intensive roof garden assemblies loose-laid root barrier over the extruded polystyrene insulation layer and seam in accordance with manufacturer's current recommendations for the field conditions and membrane specified.
        3. Extend root barrier up walls, curbs, etc. to the height of the top of the growth media layer.

\*\* NOTE TO SPECIFIER \*\* On Intensive (deep) garden applications, MiraDRAIN HC Drainage Board may be used as a substitute to the drainage gravel and CCW 300HV Protection Fabric used beneath the growth media and above the root barrier. Delete if not required.

* + 1. Growth Media/Planting
       1. Spread engineered soil mixes to the specified depth, plus 15 percent. Dispense to locations in a manner that will not overload the structure.
       2. Thoroughly soak soil with water using a sprinkler or hand sprayer.
       3. Plant vegetation in accordance with the landscape architect/designer plans and instructions for the intended soil and climate.
  1. DAILY SEALS
     1. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.
     2. Use Sure-Seal Pourable Sealer or other acceptable membrane seal in accordance with the manufacturer's requirements.
  2. CLEAN UP
     1. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.
     2. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.
  3. PROTECTION
     1. Protect installed products until completion of project.
     2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION